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Soil Conservation

SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

"Soil conservation districts have had tremendous impact upon American agriculture. They are changing the landscape of America into a pattern of utility and beauty."

—SENATOR JAMES E. MURRAY

CONTENTS

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VOL. XXVI, NO. 1 AUGUST 1960

v.26 Aug. 1960-July 1961

PAGE

3 Pastures, Pines, and Ponds
By Barrington King

6 Good Leadership of District Supervisors
By A. B. Foster

9 Livestock to Dust to Livestock
By David O. Davis and Paul N. Miller

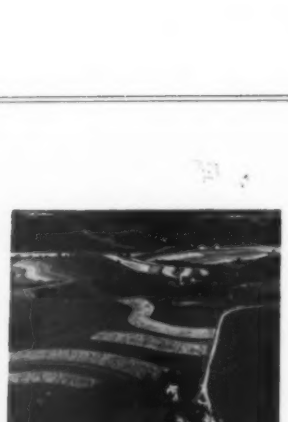
12 Saga of the Sand Dunes
By Kent Alverson

15 19 Years of Conservation Pays
By Herb Boddy

17 Two-Way Radio Speeds Conservation Work
By Herbert I. Jones

19 Farmers Go to Grass
By Leon J. Sisk

22 A Book Designer Turns Conservationist
By Lester Fox



COVER PICTURE.—Aerial view of a landscape where utility and beauty are combined, in the Vernon County Soil Conservation District of Wisconsin.

—Photo by Erwin Cole

Soil Conservation

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TOM DALE, Editor

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Pastures, Pines, and Ponds

Heal Erosion Scars of Fairfield County

By Barrington King

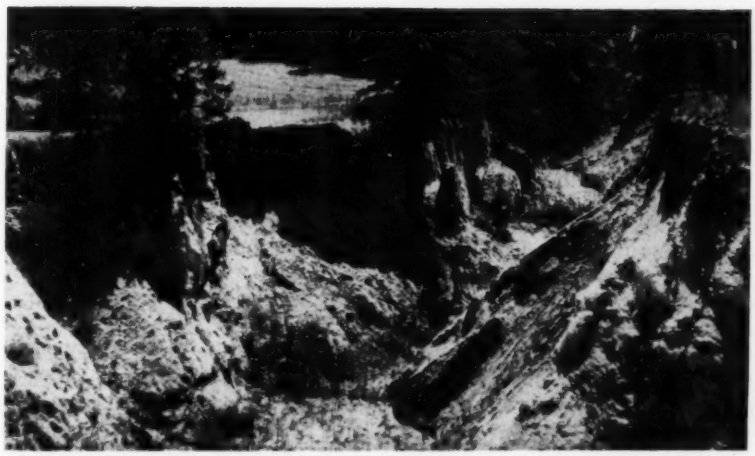
VISITORS who travel the main highways or county roads of Fairfield County, S. C., see few tilled acres. But they see a seemingly endless expanse of pastures and pines. Dotting the landscape are hundreds of farm ponds—ponds that farmers have built to provide water for their growing herds of dairy and beef cattle.

It is difficult to imagine, therefore, that when Hugh H. Bennett wrote his famous "Soil Erosion, A National Menace" in 1928, he cited Fairfield County as an outstanding example of land destruction through misuse. Of conditions there he wrote:

"A single county in the southern part of the Piedmont Region was found by actual survey to contain 90,000 acres of land, largely cultivated at one time, which has been ruined by erosion. The whole area has been dissected by gullies, and bedrock is exposed in thousands of places. Here and there islands or peninsulas of arable land have been left between hideous gullies, but most of the remnants are too small to cultivate."

In warning that "the extent of this devastation is yearly growing larger" he added, prophetically, that the land still had value for growing pines and for pasture. It is these two conservation uses that have so transformed the landscape of Fairfield County.

The larger gullies are still there. They can be seen in the reforested areas if you take the trouble to search them out. But today these gullied areas are producing valuable pine timber and pulpwood. And the tree growth is slowly but surely healing the scars of erosion that were so evident on the landscape 30-odd years ago.



Severe gully erosion that was typical of much of Fairfield County when this picture was taken in 1937.

In this issue of SOIL CONSERVATION are stories on the history and achievements of six soil conservation districts in widely scattered parts of the United States. We consider these districts and their accomplishments more or less representative of the more than 2,900 districts of the Nation, except that all six of them were among the first districts organized in their respective States. Hence, their achievements should be, and probably are, greater than in most of the newer soil conservation districts. The first of these stories begins on this page.

—Editor

The tree planting program was started during CCC camp days. The camp at Parr Shoals was one of the first erosion-control camps in the entire country. This camp and another at Winnsboro planted more than a million pine trees a year in Fairfield County from 1935 through 1941.

S. D. Cathcart, chairman of the board of supervisors of the Fairfield Soil Conservation District and director of a bank in Winnsboro, recalls those days. Back then, he says, tree planting wasn't too popular, even though the Federal Government furnished the trees and the CCC boys planted them. "I wasn't too enthusiastic about it myself when they planted pines on my place," he admitted. "But if we had gone on as we were headed, this county would have been finished in another 50 years.

Note:—The author is information specialist, Soil Conservation Service, Spartanburg, S. C.

Fairfield County's future farmers help in the district program.

"Nobody took much interest in cattle," he continued. "We just let the few cows we had graze the woods. In 1938, I took 25 or 30 acres out of cultivation and fertilized it for pasture. That was the first real pasture I had."

In 1938 Fairfield County joined 3 other counties and organized the Catawba Soil Conservation District. Then in 1950 the Catawba district was divided and Fairfield County became a district in itself. Tree planting remained a prominent part of the district programs, even after the CCC camps were liquidated during World War II. And the district program was expanded to include all types of modern conservation practices, especially the development of improved pastures and farm ponds.

Operators of more than 800 of the 1,500 farm units in the county are cooperating with the Fairfield Soil Conservation District. In recent years they have planted more than 11,000 acres to pines, 15,000 acres to improved pasture, and have built 560 farm ponds, as a part of their farm conservation plans developed with the help of SCS technicians assigned to the district.

Livestock numbers have increased steadily with the development of improved pastures. Current reports show about 4,500 dairy cattle, 8,000 beef cattle, and 4,500 hogs.

The county's 37 Grade-A dairies last year sold 4 million pounds of milk for $329,000. Income from beef cattle was even higher than that, but the exact amount is difficult to estimate. In the last four or five years, a new local market that buys 250 hogs a month has revived interest in purebred hogs.

There are 16 sawmills and 3 planing mills operating in the county, employing 324 people. The annual capacity of all the mills is 40,845,000 board-feet of lumber.

Pulpwood has become a 1½-million-dollar industry. It has far outstripped cotton as the county's principal cash crop. In recent years, annual production has exceeded 100,000 cords.

Pulpwood and pastures require less labor than cotton and other row crops, which means that Fairfield has lost some of its labor force in recent years. But from the land use standpoint, the change was inevitable.

S. M. Stevenson, a banker who also operates a large farm and is a supervisor of the Fairfield SCD, has observed the changes from the standpoint of one directly concerned with both the financial and the conservation developments in the county.

"We used to handle primarily cotton loans that came due in the fall," he explained. "We do practically none of that now. Farmers have converted to dairy and beef cattle and pine trees. We also have several large turkey farms in the county. Farmers as well as their land are in better shape."

This feeling that developments on the land are definitely improved is general among civic leaders in Winnsboro. Equally definite is the belief that the time is ripe for industrial development in the county to match the progress on the land.

This is emphasized particularly by G. M. Ketchin, editor of the *News & Herald*, who has lived in Winnsboro since 1934. He is keenly aware of the improvements on the land. On the other hand, he points out, the industrial expansion hasn't been sufficient to take up the slack in farm employment that goes with the more extensive type of agriculture.

But the vigorous campaign he is carrying on through the editorial columns of the local paper seems certain eventually to bring about the balance of agriculture and industry that county leaders are seeking. They are convinced that proper land use provides a sound basis for such development.

Pastures and ponds, such as these, are an integral part of the present landscape of Fairfield County.

The various agencies and groups operating in the county are adapting their programs to the land use changes that have occurred. J. D. Lyles, county supervisor of the Farmers Home Administration, says his agency is giving more emphasis to timber and pulpwood in its appraisals and farm management plans. "All borrowers whose loans are for more than five years," Mr. Lyles stated, "are required to have a soil conservation district plan on their land."

ACP cost sharing has helped make the widespread land use changes possible. ASC county office manager W. Banks Patrick said ACP has shared in construction costs of all ponds which met requirements for livestock water and irrigation, estimated as 90 percent of the total ponds; 75 percent of the terracing; and a large part of the pasture planting and tree planting.

"What has been accomplished has been brought about by all the agencies and groups working together," Mr. Patrick summarized. "But we shouldn't overlook the tremendous part that nature herself has played in the healing process. We're just working together now in harmony with nature."

The wildlife benefits of conservation farming are one of the features that appeals most to Dave Crawford, chairman of the newly organized Wateree Watershed Conservation District. As a part of his farm conservation plan he has built 8 farm ponds, primarily to provide water for his 175 beef cows. But ducks come to the ponds by the hundreds, he reports. He also has planted eight strips of bicolor lespedeza for wildlife food.

As chairman of the watershed district, which is sponsoring a watershed protection and flood prevention project on Wateree Creek, Mr. Crawford reports that about 90 percent of the 35,000 acres in the watershed is in pines and pastures. That type of land use provides just about ideal cover for the watershed lands, he points out. But infiltration rates of the soils are low and runoff is high, in spite of the excellent ground cover. So four flood detention dams and three miles of channel improvement work will be needed to supplement the land treatment measures.

One of Fairfield County's two pulpwood yards, where farmers now find as ready a market for their trees as they once had for cotton only.

But floods aren't the only problem on Wateree Creek. In 1954, the creek bed was completely dry for four months, Mr. Crawford reports. "If we didn't have farm ponds, we couldn't be in the livestock business," he emphasized. "We haven't got nearly enough ponds yet. Instead of the 560 we have in the district, we ought to have 2,000."

One of the most striking examples of the changes that have come about in Fairfield County is related by R. M. Blair, member of the County ASC Committee and a supervisor of the Fairfield Soil Conservation District. He owns about 5,000 acres of farmland, much of which formerly was planted to cotton. Today about 90 percent is in pines. He has 250 acres of pasture, watered by nine farm ponds, and keeps around 150 head of beef cattle.

"I was talking to my brother the other day about the old home place, where Daddy used to have 16 families on 500 acres," he recalled. "The land was getting pretty eroded, and he'd plant cowpeas on it to protect it. But every time he'd plow it, it would wash more."

Mr. Blair grows only 15 acres of cotton. It is on two farms where he has a 48-acre cotton allotment. The only other row crops he has are on 125 acres of bottomland along the Broad River, where he grows feed.

"My bottomland is much safer to farm than it used to be," Mr. Blair says. He attributes this to soil conservation work on the upper reaches of the Broad River watershed and its tributary streams.

"Because of floods, Father used to count on losing every third crop of corn on the bottomland," he added. "I've planted corn on the same bottomland for the past 11 years and haven't lost a crop. I think that's one of the best examples I know of the value of soil and water conservation."

◆

The strong trend to heavier nitrogen fertilization and reduced use of lime over the past decade is making soils more acid, according to USDA surveys.

Knox County Revives Through Good Leadership of District Supervisors

By A. B. Foster

THE Knox County Soil Conservation District in Indiana owes its success to outstanding leadership of the district governing body more than to any other single factor.

It is significant that the first board of supervisors elected in 1940 was made up of farmers who were strong leaders and were outstanding farmers with prestige. This same pattern has characterized every supervisor from that time until now.

"The district's conservation program seemed to spread through efficient farmers—farmers who were doing a pretty good job but who wanted to do better. It is inefficient farmers who have ignored the program—and not all of them have." This is the studied opinion of present members of the Board and concurred in by several other farmers, some of whom have served on the Board.

Knox County is located in southwestern Indiana between the Wabash and White Rivers. It was one of the first counties in Indiana to be settled and farmed to any degree. Because of this early settlement and a type of soil that is particularly erosive, the decline of the land was severe and extensive.

Most of the soils are of a type, however, that responds to good treatment. Once good land use and proper conservation practices were applied, even the worst-eroded soils have proven to be highly productive. And good land use and conservation are becoming the rule on a great part of the county under the district's conservation program.

The chief problems — drought, erosion, and poor drainage—still exist on the farms that have not yet adopted conservation plans. Erosion and drainage have been solved on the farms of the cooperators and drought hazard has been greatly reduced as a result.

Typical erosion on Knox County land before conservation treatment.

Out of 1,665 operating units in the county there were 1,021 district cooperators with 805 basic conservation plans as of January 1, 1960. Of 302,546 acres of agricultural land in the district, 111,000 are covered by these basic plans. A total of 150,627 acres is included in the land owned or operated by the cooperators.

Among the accomplishments on the land are 509 miles of terraces; 572 ponds; 126 miles of diversion terraces; 32,703 acres of conservation crop rotations; and 271 miles of tile drains and 161 miles of open drains on over 16,000 acres of highly productive bottomlands which high water and flooding had previously rendered almost useless.

Former county agent H. S. Benson led the movement to get the district organized, the second in Indiana. His argument for the formation of the district revolved around open ditch drainage on the

Note:—The author is information specialist, Soil Conservation Service, Milwaukee, Wis.

Board of supervisors of Knox County SCD: (left to right) Ernest Miller, chairman, Harold Miller, Winton Palmer, Perry Jackson, and Paul Sprinkle.

small bottomlands. He contended that farmers were wasting money by continually redredging ditches that kept filling up with soil washed from their upland fields. He saw that the only solution was an adequate erosion control program. After the district was organized he gave it the full support of the Extension program in the county. This has been true of the Extension workers who followed him.

From the beginning, results from conservation work were spectacular, and the effect on land values was almost fantastic. The first step taken by most cooperators was to build terraces, or a combination of terraces and diversions, to head off water that rushed down the long gentle slopes. This runoff not only damaged the upland, it made fertile bottomland fields too wet to farm. Grassed waterways were of course included; and lime, fertilizer, crop rotation, residue management, and contour operations completed the picture. More recently, minimum tillage is coming into prominence. A significant change in use of pastures was brought about by the building of farm ponds where lack of stock water had always been a problem.

Interviews with cooperators and supervisors indicate how successful the program was.

Bert Shake was one of the first cooperators. He bought 150 acres in the early 1940's, two-thirds of which was so badly gullied it could not be farmed at all. After applying the practices described above and filling the gullies he now raises 40 to 50 bushels of wheat per acre. He named farm after farm in his neighborhood where he said the value of the land would not be half what it is if a conservation plan had not been applied.

In 1946 George Kerns bought 175 acres, paying $70 an acre for 123 acres, $35 an acre for 12 acres, and $125 an acre for 40 acres. The land would not support the 11 cows he then had. He now has a herd of 108 dairy cows and 40 heifers and

Lester Williams, member of the first board of supervisors of Knox County SCD, in one of his terraced fields.

was recently offered $400 an acre for the entire farm but refused to sell. Without his conservation plan he said his land would look like that of a neighbor he pointed out who was having trouble paying taxes.

Perry Jackson, a supervisor who has been on the board for 9 years, showed us some land that he paid $70 an acre for in 1937. He has refused $400 an acre for it. He figures that inflation would have increased the original value about threefold, which would have raised it to $210. The rest he credits to the conservation program.

W. S. Carnahan bought 140 acres in 1957 for $138 per acre. He spent less than $800 for terraces, diversions, and waterways. Now, 3 years later, he claims he could easily sell the farm for more than $250 per acre. A 20-acre bottomland field on this farm, according to the previous owner, "would never be any good." It was always too wet in the spring to plant and stayed too wet to harvest a crop, if there was one, in the fall. After proper drainage, the corn yield on this field in 1958 was 87 bushels per acre. In 1959 it produced 42 bushels of soybeans per acre.

Winton Palmer, a district supervisor, says his conservation plan has doubled his farm's value in 10 years. Palmer believes that 90 percent of the land that changes hands now is being bought up by district cooperators. "They are the only ones with money to buy it. And they know what they can do with so-called 'worn-out' land when they get hold of it," he said.

Harold Miller, another supervisor, was the most enthusiastic of all in evaluating the effects of the soil conservation program on the land. He believed that it increased production by 4 or 5 times, and gave his own experience to prove it. Land that yielded 10 bushels of wheat per acre now produces 50 to

Fescue grass waterway on the Winton Palmer farm of Knox County.

Terrace construction on the Perry Jackson farm in Knox County.

60 bushels. And corn yields have jumped from 25 to as high as 125 bushels per acre.

Andrew Martindale is an orchardman with 135 acres of orchard, all terraced. Formerly the fields were dry, due to the rapid runoff of water. Now, with the terraces, there is little runoff even in the hardest rains. Fruit yields are much higher. Two ponds, which were built to heal gullies, provide water for spraying.

"My less eroded land has increased 25% in value and the steepest land at least 100%," Martindale insisted.

Lespedeza was the main crop for pasture and hay before the district was organized. There was very little, if any, red clover. Now crop rotations that include red clover are standard. Acreage of lespedeza cut for hay has dropped to 747 with a total harvest of 854 tons. Alfalfa production rose from 4,183 acres and 9,863 tons in 1940 to 6,504 acres and 14,928 tons.

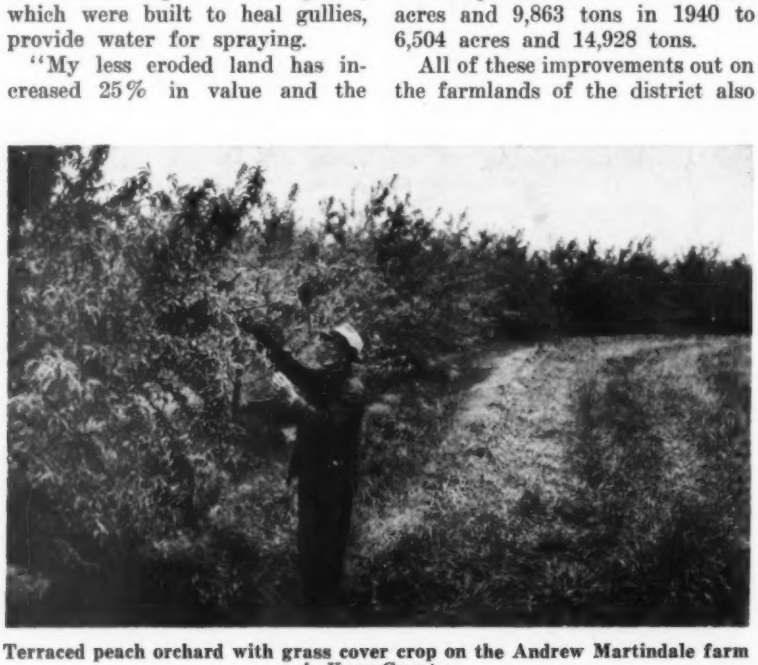
All of these improvements out on the farmlands of the district also show up on the balance sheets at the banks in the towns; and they show up on the census reports and other places where figures talk.

According to agricultural census reports, cash farm income rose from $3,445,863 in 1940 to $13,991,041 in 1954, the latest available figures. Bank deposits at the American National Bank in Vincennes rose from $4,236,335 in 1940 to $16,659,125 in 1959. At the Security Bank and Trust Company, deposits were $4,037,683 in 1943 and $12,018,997 in 1959.

The outstanding leadership of the district supervisors, the high caliber of farmers who became cooperators, and the excellent quality of the technical assistance furnished by the SCS were all major factors in the success of the district. But we cannot overlook the fact that complete endorsement of the district's program was given by other organizations.

The two banks in Vincennes contribute money regularly to finance air tours and to publish annual reports of the district. The Vincennes Kiwanis Club took an early interest in the district and sponsored the first county terracing contest, later sponsoring the first Statewide terracing contest.

The Knox County Farm Bureau Cooperative has consistently been a strong backer of the district. The county Extension program has given the district program strong support through its educational activities. The Farmers Home Administration has required conservation plans on the farms on which loans have been made to buy the land. The county highway department and the county supervisors have cooperated on work involving roads and bridges. These wholehearted cooperative efforts have helped make the job easier. Yet, we still must give the main credit to that group of outstanding farmers who helped organize the district and served on its first board, and the other leading farmers who have succeeded them.



Terraced peach orchard with grass cover crop on the Andrew Martindale farm in Knox County.

Union County Swings from

Livestock to Dust to Livestock

By David O. Davis and Paul N. Miller

THE Northeastern Soil Conservation District covers about 2,256,000 acres in Union County, New Mexico. The district was first organized in 1938, and included only the northeastern part of the county. Since then there have been nine additions until it now covers all of the county except for about 200,000 acres that are included in the East Colfax, Ute Creek, and Mesa SCD's.

Union County is in the northeastern corner of the State. Settlement first started around 1880, and in 1893 it was formally declared a county of the Territory of New Mexico. It was strictly cattle country at that time, and remained so until the Homestead Act took effect around the turn of the century. Even after that cattle grazing was the principal business; but a considerable part of the grassland was homesteaded, first in 160-acre tracts, and later in 320-acre tracts. The height of settlement was reached around 1916.

Early crops grown included corn, small grains, beans, and fruits—sorghums were introduced later. Wheat, corn, and beans were profitable crops during years of above-normal rainfall if planted on the better soils. During normal and drought years, however, even these crops often were unprofitable and crop failures were frequent. Hence, many of the homesteaders found it impossible to make a living from the meager homestead acreage. They either sold out and left or supplemented their income by buying more land or working part time for the cattlemen and others.

Farmstead in Northeastern Soil Conservation District: (above) at the time farm and farm home were abandoned in 1936; (below) the same farmstead, with new farm home, in 1959.

The population of Union County gradually declined, from a high of nearly 20,000 in 1916 to about 11,000 in 1930. Then the long drought struck in 1931 and the remaining inhabitants soon found themselves in the heart of the "dust bowl." And, as usually happens, hordes of grasshoppers came with the drought.

The northeastern part of the county, where most of the homesteaders had proved their claims, was especially hard hit by the protracted drought. Soil blowing started on some of the cultivated fields during the first years of the drought. As drought continued the soil blowing spread to most cultivated fields and to much of the overgrazed grassland. Several inches of topsoil was swept from some formerly cultivated fields. In other fields and ranges hummocks of silt and sand piled up to smother vegetation and obstruct tillage. Sand dunes were forming in many localities. More than 250,000 acres in the county were damaged by wind erosion before the drought ended in 1940.

By this time many ranchers thought that most of the range grasses were dead. Many farmers thought that most of their cultivated land was ruined for further practical use. Indeed, many grass plants did succumb for lack of water and overgrazing. And some of the shallow soils that should never have been plowed in the first place were rendered unfit for further cultivation. But the situation was not hopeless.

In 1935 one of the early wind erosion control demonstration areas of the Soil Conservation Service was started in Union County. A Land Utilization project was started in 1937, under which about 57,000 acres of the worst wind-blown land was purchased by the Federal Government by 1940.

At the time the Northeastern district was organized in 1938, things looked pretty grim to most of the cattlemen and farmers who were still trying to hang on and salvage some of their holdings. Most of the inhabitants who felt they could had already left for California or other places where they didn't have to breathe and eat dust all day long during the windy seasons.

By this time, however, some of the lands in the SCS demonstration area were showing signs of improvement, as proper land use and

Note:—The authors are, respectively, information specialist, Denver, Colo., and work unit conservationist, Clayton, N. Mex., both of the Soil Conservation Service.

water conservation practices were applied. Spots of rangeland also showed that all the grass was not dead and that these tough short grasses would recover where given a chance. As time went on it was shown that some of the better soils were suitable for permanent cultivation if the best soil and water conservation practices were used. It was mainly to spread such knowledge and get more universal application of the soil- and water-conserving measures that leading farmers and ranchers organized the soil conservation district.

The district program emphasized water conservation on both cultivated and range lands from the first. Terracing, contour tillage, and stubble mulching were the principal water-conserving practices advocated for cultivated fields. Waterspreading, contour furrowing, pitting, and pond construction were the main water conservation practices for rangeland. And irrigation developments and improvements were encouraged where practical. The Water Facilities Program of the Farmers Home Administration helped greatly on some irrigation and other water development practices, as did the cost-sharing payments of the ACP.

Flexible cropping systems were advocated, with sorghums, broom corn, and other drought- and erosion-resistant crops forming the core. Wind stripping was also encouraged, while stubble mulch tillage became a "must" in the district's conservation program.

Broad-based terraces and contour tillage conserve water in Northeastern SCD.

For the rangelands, deferred grazing, rotation grazing, dispersed grazing, and proper stocking became standard practices to supplement the water conservation program. But even with these practices properly applied, a considerable amount of both rangeland and abandoned cropland sorely needed reseeding.

At the height of the homestead boom more than 300,000 acres of land were in cultivation in the Northeastern SCD. Some of this had been abandoned even before the drought of the 1930's. During that decade about 46,000 acres were abandoned and left to blow or "go back" to weeds. Of the 57,000 acres purchased by the Federal Government under the LU program, nearly two-thirds was formerly cultivated land that was bare of permanent vegetation. Revegetating these bare lands presented quite a problem, and has been a major objective of the district ever since its organization.

Since 1940 about 127,000 acres of former cropland have been planted to grass in the Northeastern district. About 35,000 acres of this "go back" land is Federally owned on the Land Utilization project; the remaining 92,000 acres is privately owned land, some of which is in the Conservation Reserve of the Soil Bank.

The Federal lands on the LU project have been a principal source of grass seed for the revegetation work in the district. In 1958 nearly 35,000 pounds of grass seed were harvested from the LU lands and made available for reseeding conservation reserve and other land.

The reseeded lands now provide some of the best grazing to be found in this area; some of these new ranges produce much more forage than the native ranges. But nearly all ranges in the Northeast district now produce more forage

Grain sorghums are used extensively in all cropping plans for Union County farms, because of their resistance to drought and wind erosion.

than at any time since early settlement. This is due mainly to the water conservation work and better range management. There has been what almost amounts to a revolution in the ways of thinking of the average stockman in this district. He now measures the production of his range in pounds of beef rather than the number of cattle he can run on his range.

The cultivated lands still under the plow are more productive, too. They are chiefly on the better soils and most of them are farmed according to the district conservation program. Also, around 40 irrigation wells have been drilled in recent years. These add considerably to the agricultural output of the district. All in all, Union County is now in better shape and has a more stable agriculture than at any time since the homesteaders began to arrive in large numbers.

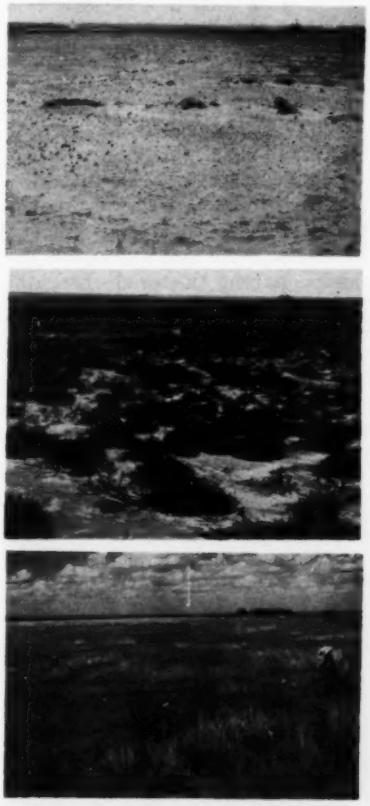
The conservation work in the Northeastern district received a good test in the early 1950's, when a drought almost as severe and long as that of the 1930's came. This brought much hardship to the area. A reduction in cattle numbers was forced on most ranges and many ranchers had to buy feed or market poor cattle at a loss. Some crop failures occurred on many cultivated fields. And there was some dust in the air, while occasional fields blew severely. Times were hard. But there was no general recurrence of a dust bowl and no great exodus of inhabitants as in the 1930's. Most farmers and ranchers stayed on their land and fought through until the rains came again.

In 1960 there were 680 landowners in the Northeastern SCD. Of these, 470 were cooperators with the district. Their district agreements covered 1,882,962 acres. Of these cooperators, 348 had developed basic plans that covered nearly 1,500,000 acres.

The Great Plains Conservation Program has given quite a boost to the district program recently. During the first two years of its operation, 28 district cooperators signed Great Plains contracts, and 40 others applied for such assistance. These Great Plains contracts are generally an acceleration of treatment and a revision of the district agreements previously signed. This program offers a sure and dependable means of cost-sharing to finance the needed conservation improvements. It should help greatly in speeding up the total conservation job.

The conservation needs in Northeastern SCD still are great. But progress has been accelerating in recent years. Application for watershed protection and flood prevention work has been made for 12 watersheds in the district. Operations are underway in one project—the Tramperos Creek watershed. Six other projects already approved by the State engineer include one with planning going on now, and two others with planning to begin this year. These projects should give further acceleration to the program, especially in the water conservation phase.

More important is the attitude of the district supervisors and the conservation ranchers and farmers. They realize that droughts and grasshoppers will plague them again. But they think they have most of the answers for these twin evils—and they fully expect to find the answers they lack. They are now surer than ever that they can live and farm and ranch successfully in Union County. And they are determined to finish the conservation job and complete the swing from livestock to dust and back to livestock.



Revegetation of wind-eroded land in Northeastern SCD: (above) abandoned field, as it looked in 1937; (center) the same field covered with weeds and Russian thistle, in 1939; (below) the same field with good cover of grama grass, in 1959.

Nitrogen Key to Continuous Cropping

Ohio Experiment Station cropping studies over a six-year period indicate that corn could be grown every year where soil erosion is not a problem if adequate nitrogen fertilization is used.

At Wooster, continuous corn with nitrogen averaged 87 bushels over the 6-year period as compared to 73 bushels for corn in a corn-wheat-alfalfa rotation without nitrogen. Corn in the same rotation with nitrogen added yielded 93 bushels. Yield varied seasonally, but showed no tendency to decrease under several years of continuous corn.

At the Northwestern Substation, corn yields with adequate nitrogen fertilization in a corn-bean rotation showed no tendency to decrease under this intensive cropping system. Corn yields without nitrogen decreased each year at both locations, emphasizing the need for nitrogen where corn does not follow a meadow crop with a good legume.

Soil conservation district story tells

Saga of the Sand Dunes

West Ottawa farmers turn them green

By Kent Alverson

WASHINGTON Street in downtown Grand Haven, Mich., ends abruptly on the east bank of the Grand River. Across the river, in direct line with this "main" street, is a huge "mountain" of sand, sparsely covered with vegetation. This is Dewey Hill.

To the many tourists who drive through town toward Grand Haven's popular Lake Michigan beach, Dewey Hill is an eyecatching part of the scenery. To local residents, it is a symbol of a 20-year struggle to rescue lake-bound Ottawa County from the ravages of wind and water.

Until stabilized by community efforts, Dewey Hill was an active sand dune, dumping tons of sand into the river each year and threatening the city. Years ago, Grand Haven started to develop on the west bank of the river. But sand pouring over the steep front slope of the dune began to cover buildings. The railroad tracks and station disappeared from view. Houses that could be saved were hauled across the ice of the Grand River in mid-winter. Now nothing remains on the west side but the dune itself.

Ottawa County in West Central Michigan formerly was a great lumber-producing area. After 1890, when most of the best timber had been stripped off, the soils produced a rich harvest of grains and fruits.

But the 8 inches or so of organic topsoil developed under timber cover was scant protection for the sandy parent material beneath. When plowed and exposed to the elements, it wasn't long before the thin layer of topsoil had blown or washed away. Prevailing southwesterly winds piled up gigantic sand dunes near Lake Michigan. Sand from these dunes and from secondary lake beds, in a relentless eastward movement, engulfed thousands of acres of western Michigan land. By the 1930's, the west half of Ottawa County was being eroded by wind, the east half by water. Dust storms, sand blows, drought, and crop failures, along with the pitifully low prices for farm products, were driving farmers off the land.

As early as 1934, the county board of supervisors received complaints from farmers that the roads were being made impassable by the drifting sands. One railroad in the county used a snowplow during the dry season to clear the tracks of sand so the trains could get through. Many farms had become tax delinquent and had reverted to State ownership.

It was in this setting that the West Ottawa Soil Conservation District was formed, beginning with a campaign in the seven townships being most severely damaged.

The county supervisors were urging passage of a State enabling act and organization of a local district. Many local people and groups formed to support the idea. The State district enabling act was passed in 1937. In an enthusiastic referendum held in April 1938, landowners established their district by a vote of 808 to 11. West Ottawa was the first soil conservation district in Michigan.

A physical and economic survey of the seven townships in the original West Ottawa district was made in 1938. It showed net cash receipts

Note:—The author is information specialist, Soil Conservation Service, Milwaukee, Wis.

Dewey Hill with present vegetative cover, left, with Grand Haven in the right background.

per farm varying from $322 on the heavy soils to minus $24 on the sand dunes. The percentage of outside income ranged from about 21 percent of total income on the heavy soils to 80 percent on the dunes. Corn averaged 32.6 bushels per acre on the heavy soils and 16.9 on the sands. Other crop yields showed a similar range and low production.

The report recommended public acquisition of land not suited to farming. It advised adjustment of land to its proper use, improved crop rotations, and practices such as wind stripcropping, windbreaks, cover crops, green manure crops, pasture management, a fertility program, and terraces where needed. The district's work plan followed closely the recommendations of the survey.

Effects of the district "rubbed off" on surrounding townships and counties. West Ottawa district spread over the entire county, while other districts were formed in adjoining counties.

Through efforts of the district, a Civilian Conservation Corps camp was set up near Grand Haven. During the 4 years of the camp's operation, CCC boys planted 4½ million trees, stabilized 2,500 acres of sand dunes, and improved many acres of existing woodland.

By 1944, many acres of former wasteland were beginning to show a profit. Thinnings from early tree plantings were sold and enough trees were left to assure good stands for a future lumber market. The new plantations on every hand were an added attraction to resort visitors.

Overall yields of crops in the district had increased 20 percent. New crops were being tried. Blueberries showed promise of becoming a major crop on sand flats with high water tables and sour soils. The "Peach Ridge" area of Ottawa County had joined the district. Farmers there began sodding their orchards to prevent erosion. In October 1944 Robert Umlor said of the new practice, "It has already saved me many acres of orchards."

Up to this time the district was doing everything in its power to get more trees planted. The directors early recognized that the main obstacle to tree planting was an inadequate supply of available planting stock. Thus, in 1939 they started a district tree nursery. Much of the work was done by the directors themselves. District cooperators who were anxious to get on with the tree planting job were willing helpers. Financial assistance came from the county board of supervisors. This was the first district tree nursery in the State.

The nursery proved extremely successful and district cooperators soon were enthusiastically planting jack, red, white, and Scotch pine and Norway and white spruce, purchased at low cost from the district, at a rate of more than two million a year.

The district also was administering 6,200 acres of badly eroded "L.U." land, purchased in scattered parcels under the Bankhead-Jones Act, and 1,022 acres of county-owned land. Most of this land was "open blows" taken out of farming to protect adjoining land. (About 1953, all L.U. land was transferred from SCS to the Forest Service, but the district still administers it under agreement with that agency.)

Revegetation of blown-out sandy land in West Ottawa SCD: (above) as the area looked in 1944; (below) after revegetation with beachgrass, in 1950. H. H. Bennett, former Chief of SCS, is shown in both pictures.

Townspeople got into the tree-planting act in a number of ways: through the schools and school forests, Scout and 4-H projects, and a community project to completely plant Dewey Hill.

Alfalfa pasture in West Ottawa SCD on land that formerly was severely eroded.

The district borrowed money to open up marl beds because most of the land in the district was sour and there was no ready source of lime. Later, when the AAA came along with its cost-sharing program (now under ACPS), the district stepped out of the lime and marl business.

By 1949, farmers had converted 13,000 acres from worthless sand to trees. Much of this land, formerly tax delinquent, was now paying taxes and increasing the wealth of the county.

District leaders then began to stress other phases of the conservation program. In 1953, the district established six erosion and runoff plots in Jamestown township to demonstrate loss of soil by improper methods of farming. More accent was placed on cover crops, stripcropping, pasture improvement, wildlife area improvement, drainage, and irrigation.

The picture today is in striking contrast to the "dirty thirties." While there still is a need and a demand for tree planting, the west half of Ottawa County is definitely stabilized. As one resident said, "Our children have grown up in a forest."

Cover crops are being used on crop and orchard land. Agriculture is booming throughout the district. A recent report of Richard Machiele, local Extension director, stated:

"On the west side of the county . . . most of the land is now covered with beachgrass or has been planted to trees. Some district cooperators have planted tens of thousands of trees from which has sprung a tremendous Christmas tree enterprise . . . an estimated 1,500,000 Christmas trees have been sold this past season.

"The acid, low-lying Saugatuck and Newton sands have produced another industry . . . the production of blueberries. The 1,500 acres now planted produce a large gross income."

Land values have boomed. Planted blueberry land is valued at $1,000 per acre. Land planted to trees varies from about $100 to $500 per acre according to its use and the volume of business from nursery stock, seedlings, Christmas trees, or lumber.

The last work report of the Soil Conservation Service shows it has helped 1,839 district cooperators with 127,196 acres of land. Some of the main practices installed to date include: Improved crop rotation, 70,180 acres; cover crops, 1,388 acres; stripcropping, 7,440 acres; tree planting, 25,373 acres; windbreak planting, 234 miles; dune stabilization, 2,684 acres; hedgerow planting, 9,209 rods; and improved drainage, 10,576 acres.

Clarence Reenders, chairman of the Soil Conservation District board of directors, summed up the present situation when he said:

"We are no longer concerned with submarginal land. That's pretty well tied down. Today technicians can help farmers make better use of the good land and keep it productive. There's more income, more grain and hay per acre than any other time I can remember. The district got our land back on the tax rolls. Schools are better and we have built some new ones. Business is better and the community is more prosperous. It's a better place to live."

You can find a lot of others in Ottawa County—farmers, townspeople, bankers, merchants—who will tell you the same thing.

Christmas tree harvest time in the West Ottawa SCD.

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Wheel-track planting solves two problems at once—soil and water losses and weeds. Tractor wheel tracks make an adequate seedbed for corn, and the area between the rows is left rough—not a very good seedbed for weeds. This means that corn can get the jump on weeds; in fact, weeds between the rows may never become a great problem, or at least can be handled with minimum cultivation.

A finely worked seedbed is highly susceptible to soil and water losses. Heavy rainfall can quickly break down soil particles to a sticky, gummy surface seal that retards water insoak. If water cannot enter the soil freely and easily, it must run off; and when water runs off, it carries soil with it.

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With 30 percent more customers since 1940, the American farmer has supplied those customers with about 53 percent more food.

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The farmer's share of the consumer's dollar dropped from 40 cents in June 1958 to 38 cents for the same month in 1959.

Gold Ridge Farmers Say:

19 Years of Conservation Pays

By Herb Boddy

THE directors and cooperators of the Gold Ridge Soil Conservation District in Sonoma County, Calif., today are enjoying the fruits and benefits of more than 19 years of soil and water conservation work. Good gains have been made in controlling sheet and gully erosion and sand dunes; fruit, dairy, and poultry production has showed a steady gain; and water has become more plentiful because of water development work.

These gains have been accomplished, say district directors, in a friendly and harmonious setting by farmers and ranchers with the zeal and will to put needed soil and water conservation work on the land. The improved prosperity of individual landowners has helped establish a more stable and improved economy for the community as a whole.

Farmers in the Gold Ridge area got their first introduction to planned soil conservation work in 1935 when a Civilian Conservation Corps camp was set up near Sebastopol to provide labor for an erosion control demonstration project.

Until the CCC boys moved in, farmers had had little to do with soil conservation and they had much to learn about erosion and good land management. Soon after the CCC began work on the demonstration project, the farmers organized a Soil Erosion Association to guide the work of the CCC, in much the same way as the SCD boards direct conservation activities today.

In 1941, when the CCC camp was closed down, a work load amounting to two years' work for the 200-man camp was left undone. The farmers' Soil Erosion Association, bent on continuing the erosion control work and carrying out other needed conservation work, organized the Gold Ridge Soil Conservation District, without opposition, in January 1941.

Gold Ridge SCD is in the west-central part of Sonoma County, about 60 miles north of San Francisco, and is bounded on the west by the Pacific Ocean. When the district was voted in, it covered about 99,000 acres; but three additions have increased the size to 134,000 acres and a total of 2,016 farm operating units.

The district's farming enterprises, in order of their importance, include dairying, apple orchards, poultry, berries, sheep, beef, and forest products.

The district's major problems—erosion control, drainage, and water conservation—can be charged to climatic, soil, and topographic conditions. There is no Class I land and every acre needs some kind of conservation work. Most soils are sandy, and the land is rolling to steep. The high rainfall, running from 40 to nearly 100 inches a year, comes between October and May.

Since 1941 nearly 1,800 farmers and ranchers have requested some kind of assistance from the district. About 1,200 farm operators have basic conservation plans for their acreages. The conservation accomplishments have been impressive.

Good cover crops for erosion control and to build up the humus content in the sandy soils are being

Revegetation of sand dunes in Gold Ridge SCD: (above) volunteer community workers planting European beachgrass cuttings near Bodega Bay; (center) airplane fertilizing dunegrass planting, one month after cuttings were set out; (below) a four-year-old beachgrass planting that has been fertilized twice by airplane.

Note:—The author is information specialist, Soil Conservation Service, Berkeley, Calif.

Laying 8-inch drain tile in the Gold Ridge SCD.

grown by many farmers. So far 8,204 acres have been thus treated and 1,000 acres are yet to be treated.

Regular applications of fertilizer on 7,500 acres are being used to grow adequate winter cover crops. Another 1,500 acres need to be treated.

Contour planting of orchards to control erosion are being carried out when full blocks of new orchard are planted.

To control natural drainage running through cultivated land, farmers are either carrying away drainage water underground in storm drains or constructing sodded waterways. A total of 15 miles of underground drainage lines have been constructed, making this phase of conservation work about two-thirds finished.

In the coastal area of the Gold Ridge district, springs and seepage cause many drainage problems. These problems are being solved by installation of gravel-packed tile drains, 5 miles of which have been laid to date. This job is about one-third completed.

Where water is available or can be developed by dam construction, orchardists are establishing permanent irrigated cover crops. This type of cover not only provides ideal erosion control, but also supplies the supplemental water so badly needed during long dry seasons. This work has been going on only in recent years, but as more water is developed, most of the fruit land will be irrigated.

Livestock ranchers used to grow an annual type of oat and vetch hay which called for preparing a seedbed in the fall, often during the rainy season. When the rains came, hay lands had little or no protection against erosion and soil losses were often severe.

Farmers are now converting from oats-vetch hay to hay composed of perennial grasses or clovers, or are changing hay land to grazing use.

Contour planting of holly trees in Gold Ridge SCD.

Of the 15,000 acres of eroded hay land in the district, two-thirds have now been converted to permanent cover.

Several thousand acres of once heavily eroded cultivated orchard and hay land in Classes IV, VI and VII have been converted to crops having year-round cover.

Around 1,500 acres of sand dunes along the ocean side of the district are gradually being brought under control through the joint cooperation of the Gold Ridge district, the California State Division of Parks and Beaches, private landowners, Bodega Bay Grange, Boy Scout troops, and Sonoma County Board of Supervisors. Only 300 acres now remain to be controlled.

These sand dunes were moving into valuable farmland and the community of Bodega Bay, were contributing heavily to drainage problems, and caused heavy silting of Bodega Bay, a pleasure resort and the home base for large fishing fleets.

In this area of seasonal rainfall where water conservation is so important for stockwater and irrigation, ranchers have built 101 stock ponds and irrigation reservoirs. New reservoirs are being built at the rate of about 10 a year.

The Gold Ridge SCD employs an equipment manager to service, route, and handle the many pieces of small equipment owned by the district. Many small ranches require such equipment as fertilizer spreaders and seeders, and the district fills this need.

This district has an active educational program, both in the schools and for the general public. District directors sponsor a conservation essay contest each year for Analy High School biology classes. Window displays in the district office in Sebastopol are changed weekly. Timely and helpful press stories are released. Materials are purchased and provided district clergymen for their use during Soil Stewardship Week. District offi-

cials and SCS staff members participate on programs of civic and farm groups.

The Gold Ridge district also is a sponsor of the $11,730,000 Central Sonoma watershed project and the Laguna watershed project, both of which fall largely within the district's boundaries.

After 19 years of operation the Gold Ridge remains a very active district. Thirty to forty basic conservation plans are prepared each year. The district directors are interested in their job, both locally and from a Statewide viewpoint. They are very proud of the dune control project at Bodega Bay, proceeding under district leadership.

Ezra Briggs, who has been on the board as its chairman since the district was organized in 1941, made the following comments about the district program:

"We used to have whole fields that were full of gullies, coming down into the draws. That was taking plenty of topsoil, many tons of it, every good rain. When we put this land in permanent pasture our soil losses stopped. There is no erosion in these fields now. This is due entirely to soil conservation district activities and the practices we encouraged farmers to use.

"We are producing 100 pounds a head more butterfat from our cows than in the days before the district. Production of dairy products has increased a third or more since the district was formed, and, in addition, ten to fifteen thousand head of sheep are now being raised on the same land we formerly used only for grazing dairy cattle.

"For the past five years or more we have done a lot of work on the sand dunes along the ocean beaches. Planting of grasses has prevented sand blows which filled up Bodega Bay. The bay had to be dredged twice before we started our plantings. Last year we put in 2,400,000 plants (dunegrass cuttings).

"Before we had the district and the help of the SCS technicians, we used to sit around and talk about the problems we were having, but we did not know what to do to correct them. We needed someone to help us organize and give us advice. Without the technical assistance, it probably would never have gotten done.

"We do not say that in Gold Ridge we have gone all the way. We maybe have half of the job done so far. But as we go, we learn more and better ways of doing things."

Stockwater pond in Gold Ridge SCD.

Outlet of a 15-inch underground storm drain in an orchard in the Gold Ridge SCD.

Two-Way Radio Speeds Conservation Work

By Herbert I. Jones

THE Stephens County Soil Conservation District in Oklahoma claims to be the first district in the Nation to use two-way radio to speed service to its farm and ranch cooperators. The equipment was provided by the district supervisors early in 1960, in an effort to speed up grass seeding, grass seed harvesting, and other conservation operations. Bill Pitman, the district field manager, says that the 20-percent increase in grass seeding last spring may be credited largely to more efficient operations resulting from the radio setup.

At present, only 4 sets of receivers and transmitters are operated from station KKY-792. The central set is in the district office in the county seat at Duncan. One set is in Pitman's pickup, another in the truck used by district-employed helpers of Pitman, and the fourth set in the car used by Bob R. Brown, the SCS work unit con-

Note:—The author is information specialist, Soil Conservation Service, Denver, Colo.

DETROIT PUBLIC LIBRARY

Bob R. Brown, SCS conservationist (left), and Nolen J. Fuqua, chairman of Stephens County SCD board of supervisors, use 2-way radio to route district employees in grass seeding work.

servationist. Signals go out and are received from a high-gain antenna sealed inside a 15-foot plexiglas tube mounted on a 75-foot pole at the district warehouse. The practical limits of transmission and reception are about 30 miles.

SCS conservationist Brown is credited with selling the district supervisors on the idea of 2-way radio. Brown claims he got the idea originally from his teenage son, Bob, and young Bob says he got the idea from watching the operation of a radio-equipped motor fleet of a local oil company.

The Stephens district effort that makes two-way radio practical centers on a massive campaign to convert low-class cropland to pasture. Yearly progress toward this goal has reached a peak of 13,000 acres of grass seeding a year.

Pitman keeps a full line of grass drills, spreaders, and spriggers running from one end of the district to the other helping cooperators get the results they plan with Brown and the other SCS technicians. At times he has 20 drills in action.

The supervisors feel that the district should provide such equipment mainly because it helps the district speed up the conservation job. Often, after a new type of drill is purchased and tried by the district, it is sold to a farmer or rancher to help him get his work done faster. Since he usually shares the machine with neighbors, he speeds up their seeding, too, and awakens new interest in the district program.

The supervisors think the new radio will help in seed harvesting when that season rolls around just as it did during the drilling season. Combining, cleaning, and selling seed is part of the district's service. Most of this job is handled by custom operators.

In one year recently, manager Pitman supervised the harvesting of 175,000 pounds of native bluestem, King Ranch bluestem, and lovegrass seed. Last spring he saw nearly half that amount planted in the range reseeding program of the district. The rest of the harvested seed went to nearby districts.

Between harvest and drilling, there's the warehouse to run. It, too, is operated as a service to the farmers and ranchers. New seed is carefully cured, dried, and cleaned to insure top germination.

The district is a certified vendor by Agricultural Stabilization and Conservation Committee standards, and it works closely with the Agricultural Conservation Program.

Aerial view of conservation practices in Stephens County SCD.

Bill Pitman receives instructions from the district office over the 2-way radio.

One county committeeman recently praised the district's operation for efficiency and for the help it provides the county's producers. He and the other committeemen attend district planning sessions and work closely with the district.

In addition to the extensive revegetation work, many other types of farm and ranch conservation practices are included in the district work program. Also, the Stephens district sponsors the Wildhorse Creek watershed project. This is one of the first known creek-size watersheds in the Nation to include city water development in a project carried out with Federal assistance.

Farmers and ranchers of the county keep the district office phone fairly busy in their requests for service. Many of these calls are relayed to Brown, Pitman, or the other district employees by the radio. This saves many miles of travel for the district and SCS men.

Two-way radio seems a natural under the circumstances. The transistor radio installation cost about $3,500. The county civil defense group paid about half of this with the understanding that the district operators and equipment would be volunteered for emergency work involving the defense unit.

The equipment is proving so satisfactory that there is talk of five additional sets. One or two of these will go in the supervisors' personal cars. Then they can keep tuned in all day on what supervisor Clyde Stanton calls "our favorite radio program."

Caucasian bluestem, 1 year after planting, on the Ralph Emory ranch near Duncan, Okla.

All of Smith County prospers when

Farmers Go to Grass

By Leon J. Sisk

From corn to grass . . .
From plow to cow . . .
From pitchfork to haybaler . . .
From backyard washpot to electric washer . . .
From drab, gullied landscape to beautiful countryside . . .

These are just a few of the more visible evidences of what its soil conservation district means to Smith County, Tennessee.

R. L. (Bob) Dudney went to Carthage in 1945, as Soil Conservation Service work unit conservationist, to assist farmers in the newly organized Smith County Soil

Except for 2.6 acres of tobacco and a small vegetable garden, every acre of this 400-acre farm is in grass. "Not much water comes off those hills," says owner J. W. Cowan, "and what does is clear enough to drink."

Note:—The author is information specialist, Soil Conservation Service, Spartanburg, S. C.

M. J. McKinney (left) and W. C. Bridwell, Jr., of the Citizens Bank, display a sign given to Mr. McKinney for being an outstanding cooperator of the Smith County SCD in 1959.

Conservation District. He took one look at the land and told them to go to grass. Some landowners and operators merely smiled at first. Many asked questions or had to see their neighbors try it. But hundreds eventually took his advice. Today, 1,453 farmers have signed agreements with the local district supervisors and developed conservation farm plans with Dudney's technical help.

The benefits of modern conservation farming have not been confined to the land and rural people. In the lively little county seat town of Carthage, citizens are prosperous. Business is good, says everyone who is asked. And the business is built entirely on an agrarian economy. There are few industries in Carthage. Even tourist business bypasses the town on U.S. Highway 70-N, a quarter of a mile away.

Smith County has been under the plow a long time. An historical marker at the Tillman Dixon home reads, "Tillman Dixon made the first settlement here in 1787." Almost two centuries of cultivation is bound to leave its mark, especially on the shallow but highly fertile soils that predominate in Smith County. Because of the rolling terrain, the land must be farmed carefully or it will erode severely.

Corn and tobacco were the main crops until recent years. "When I same to the Smith County Soil Conservation District," Dudney says, "you could drive up on a bluff overlooking the Horse Shoe Bend of the Cumberland River and all you could see was corn."

Today all you see from that point is grass.

"At that time," continued Dudney, "I know one farmer whose corn made 8 bushels an acre. It brought $1.25 a bushel or a gross of $10 an acre. Now you'll hardly find a field of corn in the district that will not produce 50 to 100 bushels an acre. It is a matter of record that Smith County averages 11 bushels more than any nearby county."

The reason? "Land selectivity"—using the land for what it is best suited to grow, based on land capability. That means corn on the more level land and grass on the steeper land.

For example, Hooper Burton, a district cooperator, used to grow 44 acres of corn that averaged 25 to 30 bushels an acre. Now he has only 14 acres of corn on flat level land that will make 80 to 100 bushels an acre. Fourteen acres now produce more than 44 acres formerly did. As a result, Burton now has about 30 beef cattle and 40 hogs. The only feed he ever buys is some protein supplement and occasionally a little grain.

Burton's sloping land is in grass and protected by diversion ditches. That keeps the bottomland from flooding so he can grow corn there.

Such combinations of vegetative and mechanical control are characteristic of the program in the district. A list of practices used in the district includes stubble mulch farming, turning sod for row crop production, improved water disposal systems including terraces and waterways, critical area treatment, roadside erosion control planting, wildlife planting, and others. Grass, however, remains the one conservation practice most widely used. And the grass is not native grass, but Kentucky 31 fescue and Ladino clover.

Today, farms are prosperous looking, with well-cultivated fields, good crops, weed-free pastures, neat and attractive homes (many new

Multiflora rose fences separate the 300 acres of grass from the row crops on the Ed Hackett farm in Smith County.

Dairy cattle on fescue-and-clover pasture on the Delmas Gregory farm in Smith County. Gregory says: "If I was still row-cropping I'd be broke."

and many of brick), and new, modern farm equipment.

"At least 98 percent of the homes in the county have electricity," said Carl E. Kirby, manager of the Upper Cumberland Electric Membership Corporation. "But if it hadn't been for the district program, not nearly as many homes would have electricity, to say nothing of appliances. People also are installing telephones at a fast rate, and about 40 percent have put in water. Many homes are completely equipped with electric appliances."

R. L. Upchurch, hardware store owner, corroborated what Kirby said about appliance sales. He said his business, 90 percent of which is with rural people, has tripled in 13 years.

As further evidence of the value of soil and water conservation to the community, Upchurch pointed to a block of buildings including his store, all of them relatively new, on the west side of the square in Carthage. The seven stores are doing nearly a million dollars worth of business a year, Upchurch estimated. And 90 percent of it is farm business.

As hogs went out with corn, and cows came in with grass, need for a milk market developed. In 1945 a national company established a cheese plant which later became a feeder station for a nearby evaporated milk plant. Daily purchases of 30,000 pounds of milk increased to 100,000 pounds. Now other companies also buy milk in Smith County and total production is several times greater than that.

Farm equipment dealers report increased sales in the past decade and a continuing good business. Part of this has been the normal replacement of horses and mules with tractors. But it also includes milking machines, rakes, mowers, hay conveyors, and other equipment. Where 15 years ago there were few hay balers, one dealer now estimates between 200 and 300 in the soil conservation district. A local dealer sells 1,000 balls of baler twine a year, enough to tie 500,000 bales of hay.

Fertilizer dealers also are happy. A large dealer reported current sales of 850 tons a month; in 1946 monthly sales averaged 200 tons. Six petroleum products distributors report greatly increased business because of the mechanization of farms and greater prosperity. And so the story goes, both on Main Street and out in the country.

Figuring that money talks, I asked the two banks in Carthage what soil and water conservation had meant to the community. Both the Citizens Bank and the Smith County Bank reported an amazing increase in assets the past 15 years —despite little change in Carthage's population of about 2,000.

Walter G. Bridwell of the Citizen's Bank showed me the profit and loss statements for 1946 and 1958. In 1946, the bank's resources and assets were $3,472,000. In 1958 they totaled $6,332,362.

"We are proud of this achievement," Bridwell said, "and proud

It takes water as well as grass to produce milk, so ponds are much in evidence in Smith County.

of our farmers who have made it possible. Although business in general has improved, farm income has not kept pace nationally. In Smith County our assets have almost doubled because of improved farm income. That wouldn't have happened without the widespread swing to grass and other benefits of conservation farming."

Cashier Russell Pitchford of the Smith County Bank said that "what benefits farmers benefits all of us and the district program certainly benefits farmers." The Smith County Bank sponsors a pasture program each year and awards sterling silver loving cups to four winners each year.

So grass, next to soil and water themselves, has become one of the most important assets of Smith County. When the soil conservation district was first started, farmers would come into the office and talk about "seeding pastures." Now they talk about "sowing grass." Grass has become a crop.

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The chemical 2,4-DB will eliminate most broadleaf weeds in growing alfalfa without injury to the crop, Oklahoma Experiment Station trials show. E.P.T.C. has also been effective as a grass and weed eradicator in alfalfa when applied as a pre-emergence spray immediately after planting the crop or when incorporated in the soil before seeding.

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Fertilizer trials at Kansas State University comparing anhydrous ammonia and ammonium nitrate have shown that where equal amounts of nitrogen are used, yield results are essentially the same.

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The Soil Conservation Society of America will hold its 15th annual meeting August 28-31 at Ontario Agricultural College, Guelph, Ontario, Canada. Theme of the 1960 meeting is "New Technologies in Land Resource Management."

A Book Designer Turns Conservationist

By Lester Fox

ROBERT JOSEPHY was a book designer. His work kept him in the big cities: New York, Boston, Hartford. He had a yearning, though, to live in the country—to be a tiller of the soil.

So in 1934 he bought a farm near Bethel, Conn. Though he knew little about farming, he thought he would like it. He had general farming in mind. Soon, however, he decided that both the land and his own interests were best suited to growing fruit.

The land held little prospect. It was eroded and run down. Today, though, Josephy has a thriving fruit business. Of his 150-acre Blue Jay Orchards he has 60 acres in apple trees 4 to 25 years old. The 45 acres in production yielded 25,000 bushels last year—555 bushels an acre.

Note:—The author is information specialist, Soil Conservation Service, Upper Darby, Pa.

Robert Josephy gives directions to his stepson, Michael McCleery, as the latter harvests apples.

Josephy sells 80 percent of his apples through a fruit growers association which serves a 120-store grocery chain. He retails 20 percent of his crop at a roadside stand next to his orchard home. By design, the stand is part of his cooling, sorting, and packing building. He found that customers like to see the various operations. With everything under one roof, they find the whole layout conveniently arranged.

To make full use of all the apple crop, Josephy added a cider press to his roadside layout. Now customers can see how cider is made.

Josephy grows peaches and pears for his retail trade. They add to the color and variety of his wayside market. Farm-fresh eggs also bring customers; so he put in a flock of 500 chickens. He uses the manure in the orchard. Soon, Christmas trees now being grown will be sold at the roadside stand.

Josephy continued to work as a book designer after buying the farmland. But he gradually "tapered off," as he puts it, to give more time to his orchard. Six years ago he withdrew altogether from book designing to give full time to farming. He runs the whole operation with only three year-round workers in the orchard and one at the stand. During the peak season he employs as many as 30 workers—pickers, sorters, packers, etc.

Josephy learned quickly about farming. He keeps up with the work done at Beltsville, Md., and

other agricultural research centers. From the start he has consulted professional agricultural workers.

After doing a lot of cleanup work—removing brush, worthless trees and surface rocks—Josephy planted seven acres to apples in 1935. He planted five more acres in 1936 and six in 1941. Then he was through until after the war.

"Then things moved along faster," Josephy said. "We planted a new block every year."

In 1947 Josephy became a cooperator with the Fairfield County Soil Conservation District. Today he is on the five-man board that runs the district. As a district cooperator he receives help from the Soil Conservation Service on technical conservation problems.

As part of his conservation program, Josephy keeps his orchard under permanent sod. He cuts hay from 35 acres of meadow every year. He mulches the hay in a ring under the tree drip.

"I don't mulch around the trunk as there are not many feeder roots close to the tree," Josephy said. "So the mulch wouldn't do any good there. Besides, mulch around the trunk encourages mice and they can do a lot of tree damage.

"We have been able to reduce the amount of nitrogen fed directly to the trees by applying the nitrogen to the hay used as a mulch. A month or two before we cut the hay, we give the crop 100 pounds of actual nitrogen per acre. That increases the tonnage. But what's more important, it supplies more nitrogen to the trees when the hay is spread out as a mulch. The mulch releases the nitrogen slower and there's no loss from leaching."

Josephy mows the orchard sod twice a year. In the older orchards he lets the clippings stay on the ground where they fall. In the young orchards he side-rakes the clippings up to the trees.

Another conservation measure was the removal of a mile of stone walls that divided the farm into small fields.

"In one 15-acre orchard that was composed of four square fields, we gained an acre by removing the stone walls," Josephy said. "But more important was the time we gained in working the orchard as one piece."

The property has 2,500 feet of tile drains and 1,500 feet of open drainage ditches.

Josephy has built four ponds. Two big ones were built to supply irrigation water. Two small ones supply spray water.

Summing up his operations, Josephy said: "There isn't any question that a rounded conservation program increases yield and improves fruit quality. I know from observation, for example, that comparable orchards without sod have a much lower yield. And that's just one conservation practice.

"But these are not the only benefits, nor the most important ones. The greatest gain is the increase in efficiency that you get with a good conservation plan. You can get more things done quicker with less help. That's why I can manage the whole orchard myself with only three full-time men. A balanced conservation program lets you get as close to streamlined production as you can get in the farming business. Aside from conserving soil and water, that's its biggest and most important value."

Mrs. Sandy Melycher (center) takes care of customers at Josephy's roadside stand.

International Meeting of Soil Scientists

The Seventh Congress of the International Society of Soil Science will be held at the University of Wisconsin in Madison, August 15-24, 1960. The Soil Science Society of America is the sponsor, with the Soils Department of the University of Wisconsin acting as co-host. Professor E. Truog of the university's soils department is in charge of registrations and reservations.

This will be the second time that the International Society has met in the United States; the other time was the meeting of the First Congress at Washington, D. C., in 1927.

Between 1,500 and 2,000 soil scientists and other interested individuals are expected to attend the Congress in Madison. Besides the large delegations from the United States and Canada, about 400 individuals from more than 60 different countries on other continents are expected to attend.

In addition to the many scientific papers presented and the discussions held during the 10 days the Congress is in session, 3 extensive tours have been arranged. The first tour, preceding the Congress, will travel through several northeastern and midwestern States between New York and Madison. The other tours, primarily for visiting scientists from other countries, will follow the adjournment of the Congress; one will be from Madison to Washington, D. C., through midwestern and southeastern States, while the other will be from Madison to Berkeley, Calif., via Iowa, Nebraska, Colorado, New Mexico, and Arizona. All tours will be by bus and will include stops for demonstrations of American research and to study soil conservation work on farms and ranches.

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Mr. and Mrs. Seiichi Fujita receive Oustanding Conservation Farmer of the Year award for the Olinda-Kula SCD from Elmer Cravalho, chairman of the board of directors, at a dinner held in the Vineyard Chop Suey Restaurant, Maui Island, Hawaii.